



EOSDIS

NASA'S EARTH OBSERVING SYSTEM
DATA AND INFORMATION SYSTEM

Earthdata Search Usability Study Process

Summer ESIP 2016

Mark Reese

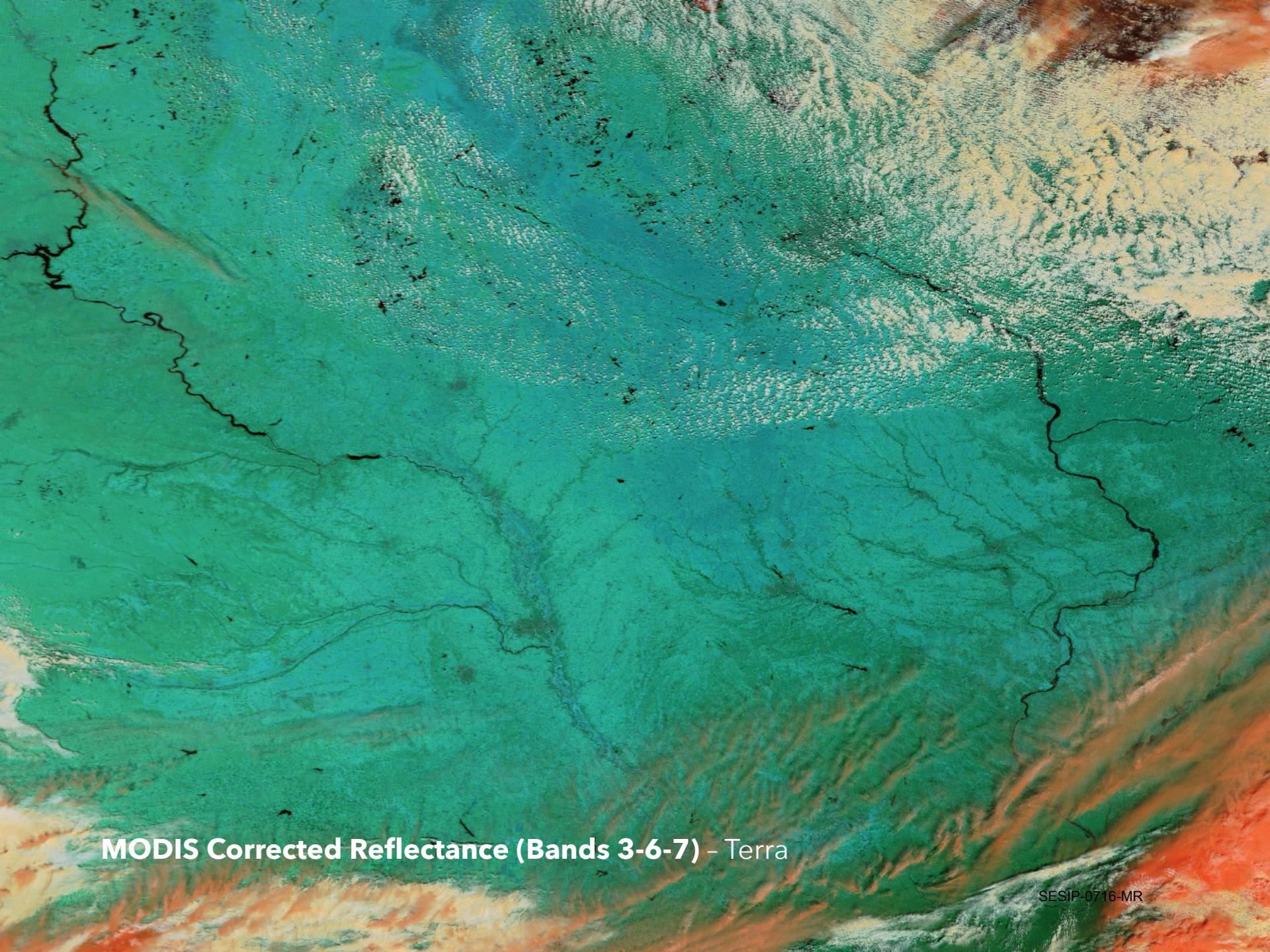
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SESIP-0716-MR



EARTHDATA SEARCH • SIOUX FALLS • APRIL 11 & 12, 2016

LP DAAC Spring User Study



MODIS Corrected Reflectance (Bands 3-6-7) - Terra

SESIP-0716-MR

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User Study Overview

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User Study Overview

Earthdata Search Earthdata NASA (National Aeronautics and Space Administration) [US] https://search.earthdata.nasa.gov/search/granules?p=C185174201-USGS_EROS&g=G185286611-USGS_EROS&m=34.611328125l-113.115234375!180 Feedback Earthdata Login

EARTHDATA Data Discovery Community Science Disciplines Clear Filters

Landsat TIRS Temporal Spatial Back to Collections

Landsat 8 Operational Land Imager (OLI)_Thermal InfraRed Sensor (TIRS) Pre-WRS-2 V1

Retrieve Collection Data Information Download Add

Showing 40 of 9616 matching granules

Sort by: Start Date, Newest first Report a metadata problem

Search Time: 0.3s

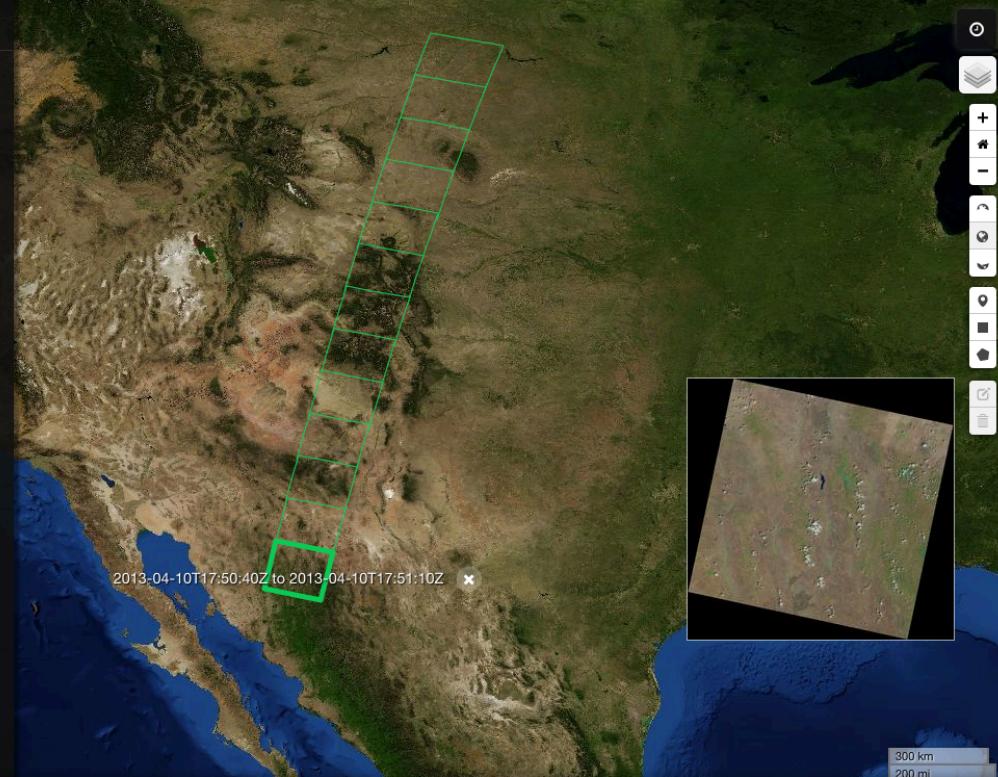
LC80340392013100LGN01 2013-04-10T17:50:40Z to 2013-04-10T17:51:10Z

LC80340382013100LGN01 2013-04-10T17:50:16Z to 2013-04-10T17:50:46Z

LC80340372013100LGN01 2013-04-10T17:49:53Z to 2013-04-10T17:50:22Z

LC80340362013100LGN01 2013-04-10T17:49:29Z to 2013-04-10T17:49:58Z

LC80340352013100LGN01 2013-04-10T17:49:05Z to 2013-04-10T17:49:37Z



300 km
200 mi

MONTH May Jun Jul Aug Sep Oct Nov Dec Jan 2016 Feb Mar Apr

v 1.16.4 • NASA Official: Andrew Mitchell • FOIA • NASA Privacy Policy • USA.gov Earthdata Access: A Section 508 accessible alternative

Landsat TIRS Granules – Earthdata Search

SESP-0716-MR

Our goal was to answer the following questions:

- 1** What are the key difficulties that people encounter when visiting the site?
- 2** How important is discoverability and relevance, given the way people typically search?
- 3** At what point do the map and timeline become useful?
At what point are they in the way?
- 4** Is the "Download All" paradigm sufficient , or is a positive selection (shopping cart) mechanism necessary?

Our Method



Survey



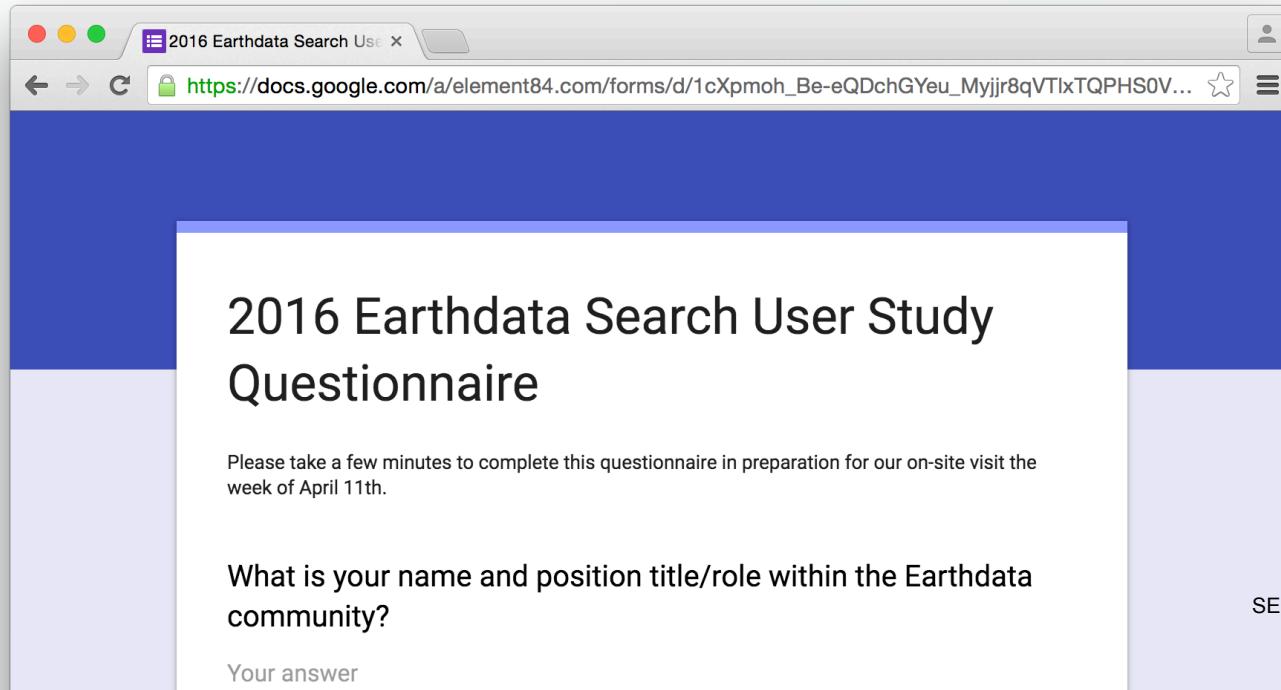
Tasks &
Questions



Analysis

Initial Questionnaire

Before the in-person user study, each participant was asked to complete a short survey about their work at LPDAAC and familiarity with Earthdata Search.



The screenshot shows a Google Forms questionnaire titled "2016 Earthdata Search User Study Questionnaire". The URL in the browser is https://docs.google.com/a/element84.com/forms/d/1cXpmoh_Be-eQDchGYeu_Myjjr8qVTlxTQPHS0V.... The form content includes a title slide with the questionnaire title and a brief instruction: "Please take a few minutes to complete this questionnaire in preparation for our on-site visit the week of April 11th." Below this is a question: "What is your name and position title/role within the Earthdata community?". A placeholder text "Your answer" is visible at the bottom of the question field.

2016 Earthdata Search User Study Questionnaire

Please take a few minutes to complete this questionnaire in preparation for our on-site visit the week of April 11th.

What is your name and position title/role within the Earthdata community?

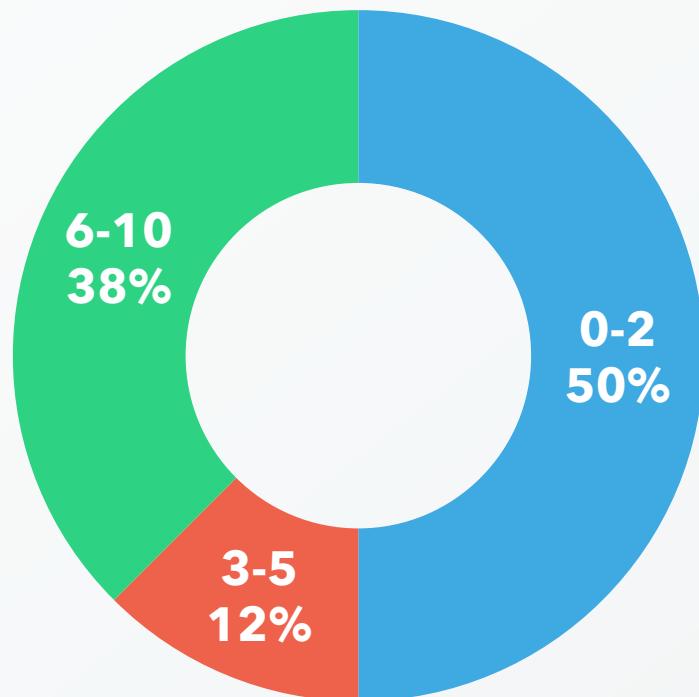
Your answer



Questionnaire Results

Week Usage Rates

How many **hours each week** do you spend with these applications?



Search & Discovery Pain Points

- ❖ Searching adjacent path and rows by date, sensor or quality for multi-decade time series.
- ❖ Removing several scenes quickly and accidentally clicking on the retrieve button. The interface often does not keep up with the user.
- ❖ Flexibility and use of KML and Shapefile searches.
- ❖ Lack of instructions and tutorials for new users.
- ❖ Identifying cloud-free scenes.
- ❖ Slow redraw/pan/zoom.
- ❖ Learning curve for new users.

Our Method



Survey



Tasks &
Questions



Analysis

User Tasks

- 1 Find a data collection hosted at LPDAAC that has map imagery and view the latest imagery over the continental US.
- 2 Find and download all Landsat 8 TIRS images from January of this year which cover Sioux Falls and have no clouds.
- 3 Find an example of ASTER and Landsat 7 data files collected within an hour of one another over Sioux Falls.
- 4 Use the client to find and retrieve data which may be relevant to your work.

Notes

The screenshot shows a web browser with three tabs open, all titled "April LP DAAC Notes: Patrick".

The leftmost tab displays a "Summary of Findings" table:

Category	Finding
Keyword Search	Expected placename search of "conterminous us" to work twice
Temporal	Left temporal box open
Collections	Eye icon not behaving as expected
Granule Results	User could not find granule results
Earthdata Login	User needed to reset password for access
Map	User unclear as to why granules which do have map imagery in reality (Landsat) did not have "Map Imagery"

The middle tab displays the "Findings" table from above.

The rightmost tab displays an "Estimated Task Completion Times" table:

Participant	Task 1	Task 2	Task 3	Task 4
Josh	10:00	10:00	15:00	06:00
Brian	NA*	12:00	NA	NA
Jennifer	9:00	DNF	NA	10:00**
Carolyn	04:00	11:00	27:00**	NA
Danielle	01:00	03:00	02:00	NA
Rynn	07:00	05:00	13:00	06:00
Ben	01:00	06:00	04:00	05:00**
Bruce	15:00	08:00	NA	10:00
Kelly	05:00	06:00	05:00	NA
Mark***				

Footnotes at the bottom:

- * Earthdata went down
- ** No ending time noted, needs video review/confirmation
- *** Mark is on the Earthdata development team, not a member of LP DAAC

Page footer: SESIP-0716-MR

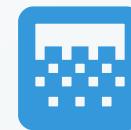
Our Method



Survey



Tasks &
Questions



Analysis

Findings & Recommendations



Metadata Quality

Keywords

Facet Quality

Users were overwhelmed by the number of facets, while simultaneously not being able to find key facets corresponding to high-value collections. This issue comes up because we only show the top 50 collections by count.

AGRICULTURE	1895
ATMOSPHERE	7359
ATMOSPHERE-BIOSPHERE INT...	1
BIOLOGICAL CLASSIFICATION	4184
BIOMASS	1
BIOOSPHERE	2
BIOSPHERE	6922
CLIMATE INDICATORS	553
CRYOSPHERE	2947
HUMAN DIMENSIONS	3872
HYDROSPHERE	99
LAND SURFACE	5313
OCEANS	10451

Facet Quality

Where is Landsat 8?

LABORATORY	691
LANDSAT	277
LANDSAT-5	206
LANDSAT-7	186
MAPS	353
METEOROLOGICAL STATIONS	395

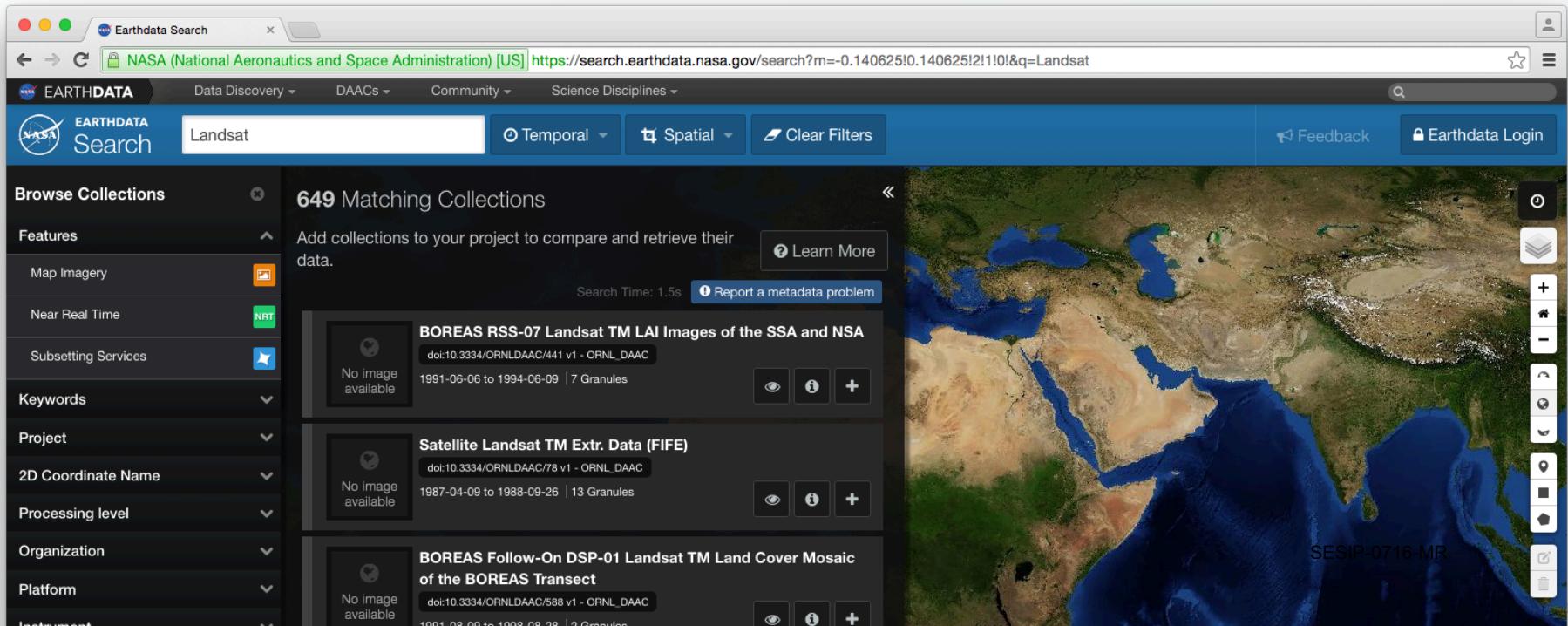
Biosphere?

BIOMASS	1
BIOOSPHERE	2
BIOSPHERE	6922
CLIMATE INDICATORS	553
CRYOSPHERE	2947
HUMAN DIMENSIONS	3872

Collections

Search Relevance

Clear-cut, highly-specific searches do not turn up what users need as the top result. Less specific searches fare worse.



The screenshot shows the Earthdata Search interface. The search bar at the top contains the text "Landsat". Below the search bar, a blue header bar displays the text "649 Matching Collections". To the right of the header is a map of the world, specifically showing the Middle East and North Africa. The map is labeled "SESIP-0716-MR". On the left side of the interface, there is a sidebar titled "Browse Collections" with various filter categories: Features, Map Imagery, Near Real Time, Subsetting Services, Keywords, Project, 2D Coordinate Name, Processing level, Organization, Platform, and Instrument. The "Keywords" section is currently expanded. The main content area displays three search results, each with a thumbnail, title, and metadata. The first result is "BOREAS RSS-07 Landsat TM LAI Images of the SSA and NSA" (doi:10.3334/ORNLDaac/441 v1 - ORNL_DAAC, 1991-06-06 to 1994-06-09, 7 Granules). The second result is "Satellite Landsat TM Extr. Data (FIFE)" (doi:10.3334/ORNLDaac/78 v1 - ORNL_DAAC, 1987-04-09 to 1988-09-26, 13 Granules). The third result is "BOREAS Follow-On DSP-01 Landsat TM Land Cover Mosaic of the BOREAS Transect" (doi:10.3334/ORNLDaac/588 v1 - ORNL_DAAC, 1991-08-09 to 1998-08-28, 12 Granules). Each result has three icons: a magnifying glass, a person, and a plus sign.

Earthdata Search

NASA (National Aeronautics and Space Administration) [US] <https://search.earthdata.nasa.gov/search?m=-0.140625!0.140625!2!1!0&q=Landsat>

EARTHDATA Search

Landsat

Temporal Spatial Clear Filters

Feedback Earthdata Login

649 Matching Collections

Add collections to your project to compare and retrieve their data.

BOREAS RSS-07 Landsat TM LAI Images of the SSA and NSA

doi:10.3334/ORNLDaac/441 v1 - ORNL_DAAC

1991-06-06 to 1994-06-09 | 7 Granules

Satellite Landsat TM Extr. Data (FIFE)

doi:10.3334/ORNLDaac/78 v1 - ORNL_DAAC

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BOREAS Follow-On DSP-01 Landsat TM Land Cover Mosaic of the BOREAS Transect

doi:10.3334/ORNLDaac/588 v1 - ORNL_DAAC

1991-08-09 to 1998-08-28 | 12 Granules

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Collections

Search Relevance

Searching for *landsat*: the 28th result is the first major Landsat collection (Landsat 7 ETM+)

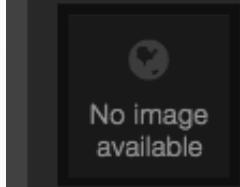
Searching for *sea ice*: mostly outdated collections at the top, collection-only with limited geographic scope

Searching for *modis*: the main LPDAAC and NSIDC collections are nowhere to be found in the first several pages of results, except for the two we artificially boost

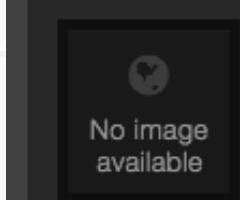
Collections

Collection Visibility

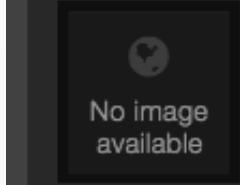
Searches often produce many results which appear very similar to one another with the fields we are able to surface. Choosing the correct one is difficult, and poor relevance makes it even trickier.



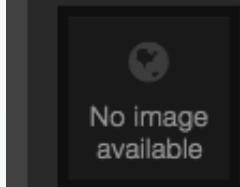
AfSIS MODIS Collection: Albedo
CIESIN_AfSIS_MODIS_ALB2012 v2012.00 - C
2000-02-01 to 2012-06-30 | Collection on



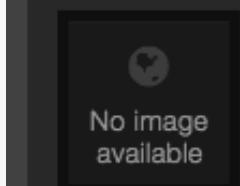
AfSIS MODIS Collection: Land Cover
CIESIN_AfSIS_MODIS_LCT2012 v2012.00 - C
2001-01-01 to 2009-12-31 | Collection on



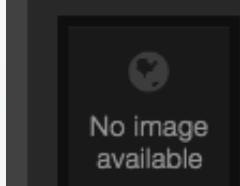
AfSIS MODIS Collection: Leaf Area Index
CIESIN_AfSIS_MODIS_LAIFPAR2012 v2012.00 - C
2000-02-01 to 2012-06-30 | Collection on



AfSIS MODIS Collection: Land Surface Temperature
CIESIN_AfSIS_MODIS_LST201404 v2014.04 - C
2002-07-01 to 2014-03-31 | Collection on



AfSIS MODIS Collection: Primary Production
CIESIN_AfSIS_MODIS_PP2012 v2014.00 - C
2000-01-01 to 2010-12-31 | Collection on



AfSIS MODIS Collection: Vegetation Index
CIESIN_AfSIS_MODIS_VEGIN201404 v2014.00 - C
2000-02-01 to 2014-03-31 | Collection on

Collection Recommendation

- Improve Quality
 - Facet helper
- Improve Relevancy
 - Based on version id (and other small wins)
 - Based on “has granules”
 - Relevancy ordering for facet searches
- Surfacing information that helps quickly distinguish collections from one another (map in preview image, file formats, abstract, etc...)



Recommendation

Next Steps

Summary: Short Term Plans

- Low hanging fruit
- Redesign Collection & Granule screens
- Reimagine Timeline

Summary: Long Term Plans

- Address metadata quality issues
- Revisit the core user and personas profiles
- My Earthdata Search™?
- Earthdata Search Lite™?

Raytheon

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contract number **NNG15HZ39C**.